

Protocol Converter

EGW1-IA3-MB

User's Manual



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For that reason, the specifications and capabilities are subject to change without prior notice.

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1 INTRODUCTION

1.1 Purpose of the manual

This manual provides the instructions for easy and quick installing and operating of the EGW1-IA3-MB. The manual starts with a general description of the product, following the instructions for the correct hardware installation. Configuration and operation of the device is detailed below.

Acronym	Description
ARP	Address Resolution Protocol
BPS	Bits per second
HTTP	Hypertext Transfer Protocol
IP	Internet Protocol
LAN	Local Area Network
PC	Personal Computer
TCP	Transmission Control Protocol
DHCP	Dynamic Host Configuration Protocol
GND	Ground (Reference)

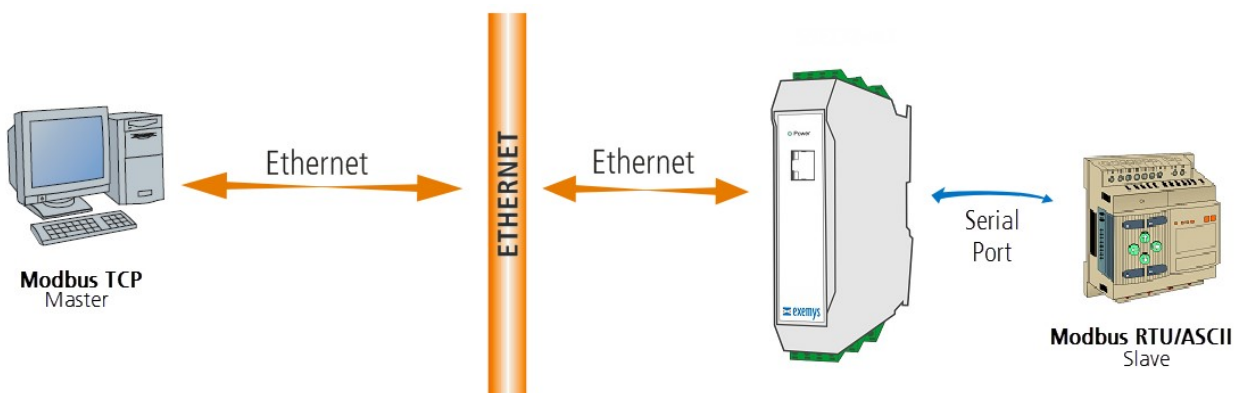
1.2 Product Overview

EGW1-IA3-MB is a Modbus TCP to Modbus Serial converter and vice versa.

It allows communication over Ethernet, with devices like alarm panels, HMI (Human-Machine-Interface) software, PLCs or any device that has a serial interface and Modbus communication protocol (ASCII or RTU).

EGW1-IA3-MB is the interface between serial communication devices and Ethernet communication devices, acting as a two-way converter.

EGW1-IA3-MB is then, a complete solution for Ethernet connectivity of devices with serial port and Modbus protocol.



1.3 Ordering Codes

The complete product ordering codes are:

Ordering Code	Description
EGW1-1C0-00-IA3-MB-IS	1 configurable port RS-232 / RS-485 isolated / RS-422 isolated.
EGW1-1C0-10C-IA3-MB-IS	1 configurable port RS-232 / RS-485 isolated / RS-422 isolated + 10 configurable digital inputs / outputs.
EGW1-4B0-00-IA3-MB	4 configurable RS-232 / RS-485 ports.

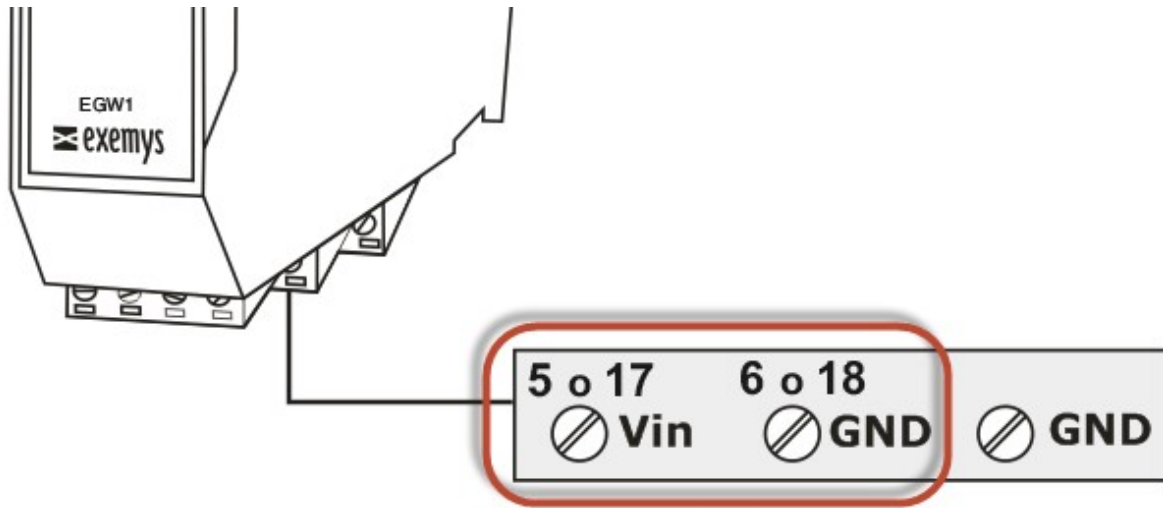
1.4 Technical Specifications

Technical Specification	
Network Protocols	Modbus TCP, TCP / IP, UDP / IP, DNS, HTTP, DHCP, ICMP, ARP, SNMP
Network Port	Ethernet 10 / 100 Mbps, RJ45 Connector
Serial Protocol	Modbus RTU, Modbus ASCII, Transparent
Serial Port	1 to 4 RS-232 / RS-485 / RS-422 depending on model Pluggable Terminal Block connection
Supported devices	Any Serial Device RS-232 / RS-485 / RS-422 with Modbus or Modbus TCP Protocol
Device Management	HTTP Server, password protected RS-232 Serial Console
Firmware Update	From Web Page
Led Indicators	Status, Data / Link
Measurements	100mm x 22,5mm x 112mm (Height x Width x Length)
Power Supply	10 to 30 V _{DC}
Consumption	12V _{DC} 70mA/ 24V _{DC} 40mA
Temperatures	Operation Temperature: -15°C to 65 °C Storage Temperature: -40°C to 75 °C
Warranty	1 Year Technical Support Included

2 INSTALLATION

1.5 Connecting the power supply

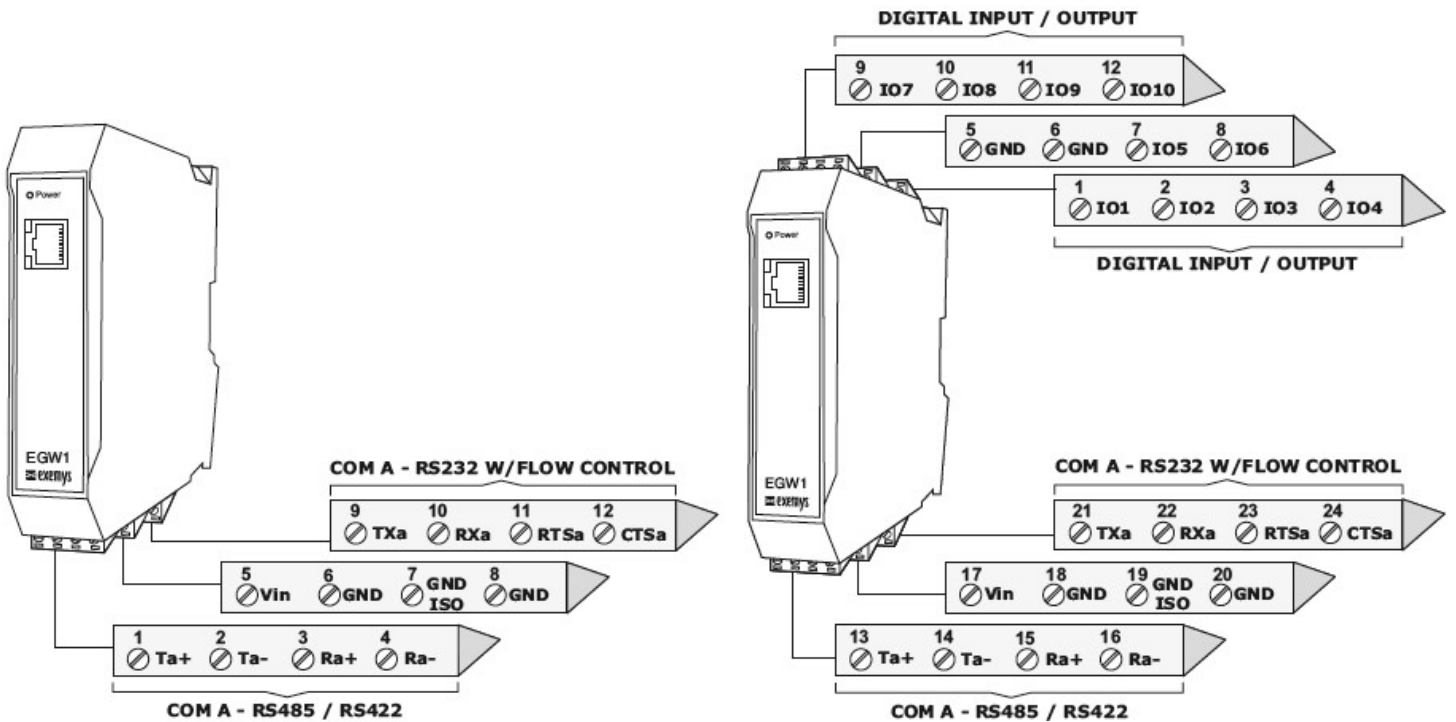
EGW1-IA3-MB allows a power supply from +10 to 30 V_{DC}. Positive power supply must be connected to terminal N° 5 or N° 17 (depending on the model) and negative power supply to terminal No. 6 or No. 18 (depending on the model), as shown in the following figure:



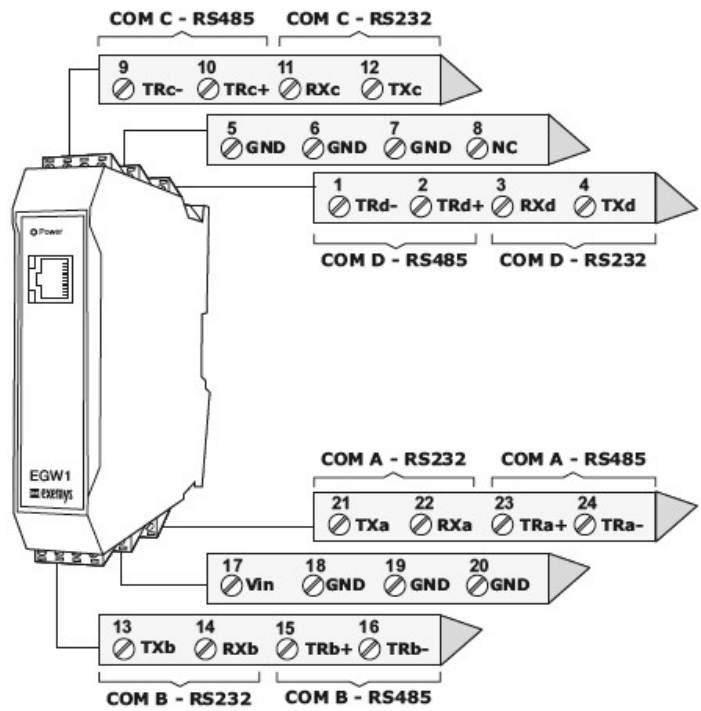
1.6 Terminal Block Connection

According to the model of the EGW1-IA3-MB it will have:

EGW1-1C0-00-IA3-MB-IS EGW1-1C0-10C-IA3-MB-IS



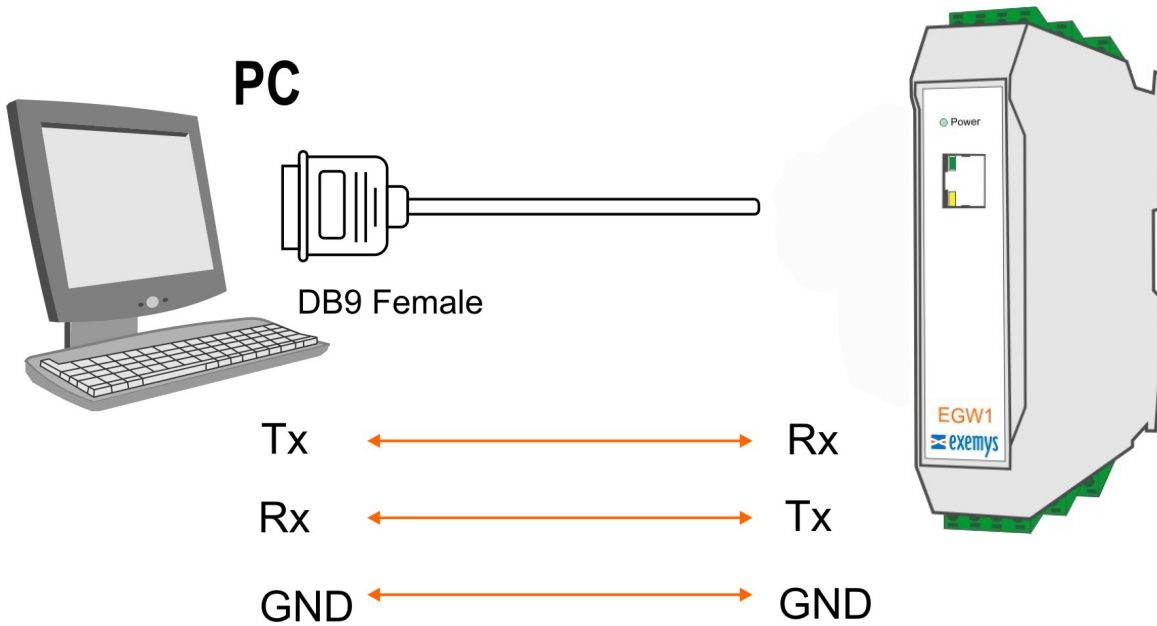
EGW1-4B0-00-IA3-MB



1.7 Serial Port Wirings

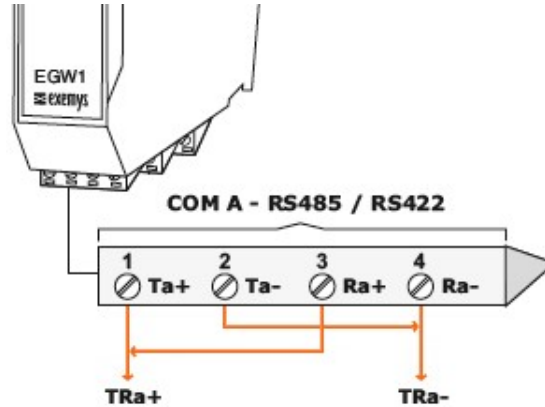
1.7.1 RS-232 ports wiring

To connect the device RS232 serial port to PC serial port or any other serial device, it must be connected as can be shown in the following figure. You should consider EGW1-IA3-MB is a DTE device, which means it must cross wire with those of the PC.



1.7.2 RS-485 port wiring

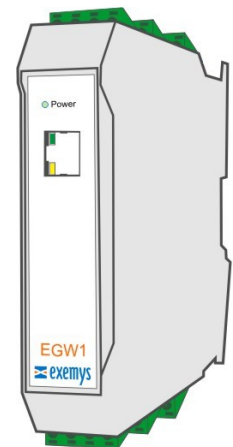
In the EGW1-1C0-00-IA3-MB-IS and EGW1-1C0-10C-IA3-MB-IS to be able to use the device port on RS485, the following connection must be made for correct operation:



1.8 LEDs Indicators

EGW1-IA3-MB has two LEDs indicators on the Ethernet connector, one green and one yellow. The yellow one shows the connection to the network, while the green one indicates the status of incoming and outgoing TCP connections.

Green	Yellow	Description
-	Solid ON	Looking for a DHCP server.
-	½ second on and ½ second off.	Waiting serial console.
-	90% of a second off and the remaining time on.	Device has an IP address and a connection bearer link. This is the normal operating state
-	10% of a second off and the remaining time on.	It has no IP address and cannot find the DHCP server. It will search the DHCP server for in 60 seconds.
-	Flashing very fast	Ethernet cable disconnected
On	-	TCP connection established
Flashing off	-	Data transmission or reception.
Flashing alternatively with Yellow LED	Flashing alternately with the Green LED	Critical Failure. Contact technical support



3 CONFIGURATION AND OPERATION

3.1 Network Configuration

EGW1-IA3-MB configuration is done through a configuration web page connecting the device to the Ethernet network on which it is going to work.

To access to the configuration web page, you must connect EGW1-IA3-MB to Ethernet network and install *Exemys Device Locator* software.

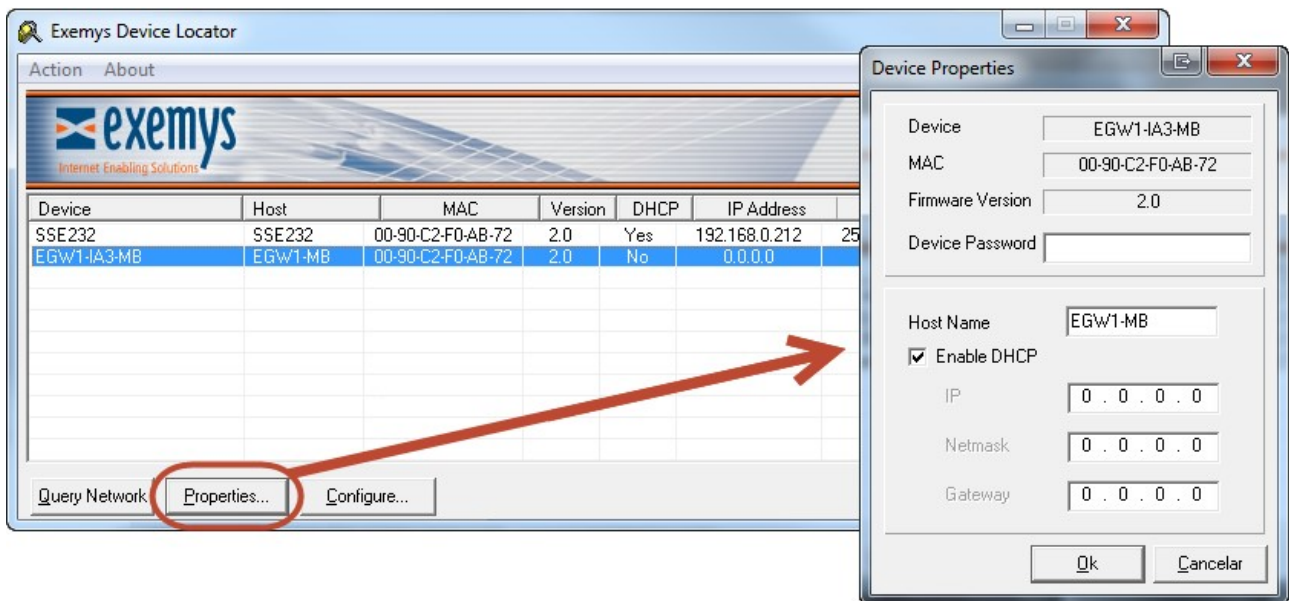
Download the *Exemys Device Locator*.

http://www.exemys.com/beta/software/edl_setup.exe

Once the device is connected, this will search for a DHCP server to obtain an IP address automatically. We will search for it using the *Exemys Device Locator* software, which allows us searching, identifying and configuring the basic network parameters. The rest of the configuration is done from the configuration web page of the device.

In case you do not have a DHCP server, the *Exemys Device Locator* will find the device with IP address 0.0.0.0, as shown in the figure below.

If you do not have a DHCP server, give it an IP address using the *Exemys Device Locator* button or using the methods explained in **Appendix D**.



The *Exemys Device Locator* buttons are:

Query Network: Searches for all connected EXEMYS devices on the same network.

Properties ...: Configuring Network Parameters (IP Address, Network Mask, and Gateway)

Configure...: Direct access to the configuration web page.

For more details on the *Exemys Device Locator* operation, see **Appendix A**.

3.2 Configuration webpage

Once the EGW1-IA3-MB has a valid IP address, you can access the web page to configure the other parameters (If your web browser is configured to search for a proxy server, disable this option)

Type the EGW1-IA3-MB IP address in the address field of your browser or from the *Exemys Device Locator*, press the Configure button.

The screenshot shows a web browser window with the address bar containing '192.168.0.212'. The browser displays the Exemys configuration page for 'Modbus TCP to Modbus RTU-ASCII Converter / EGW1-IA3-MB'. The page has a navigation menu on the left with options like 'Configuration', 'Monitoring', 'Description', and 'Administrator'. The main content area has tabs for 'Network', 'Port A', 'Modbus TCP', 'Advanced', 'Inputs/Outputs', and 'SNMP'. Under the 'Network' tab, there are fields for 'Host Name' (EGW1-IA3-MB), 'DHCP' (Enabled), and 'IP Address' (192.168.0.212). An 'Exemys Device Locator' application window is overlaid on top, showing a table of devices and a 'Configure...' button circled in red.

Device	Host	MAC	Version	DHCP	IP Address	Netmask	Gateway
EGW1-IA3-MB	EGW1-MB	00-90-C2-F0-AB-72	2.0	Si	192.168.0.212	255.255.255.0	192.168.0.200



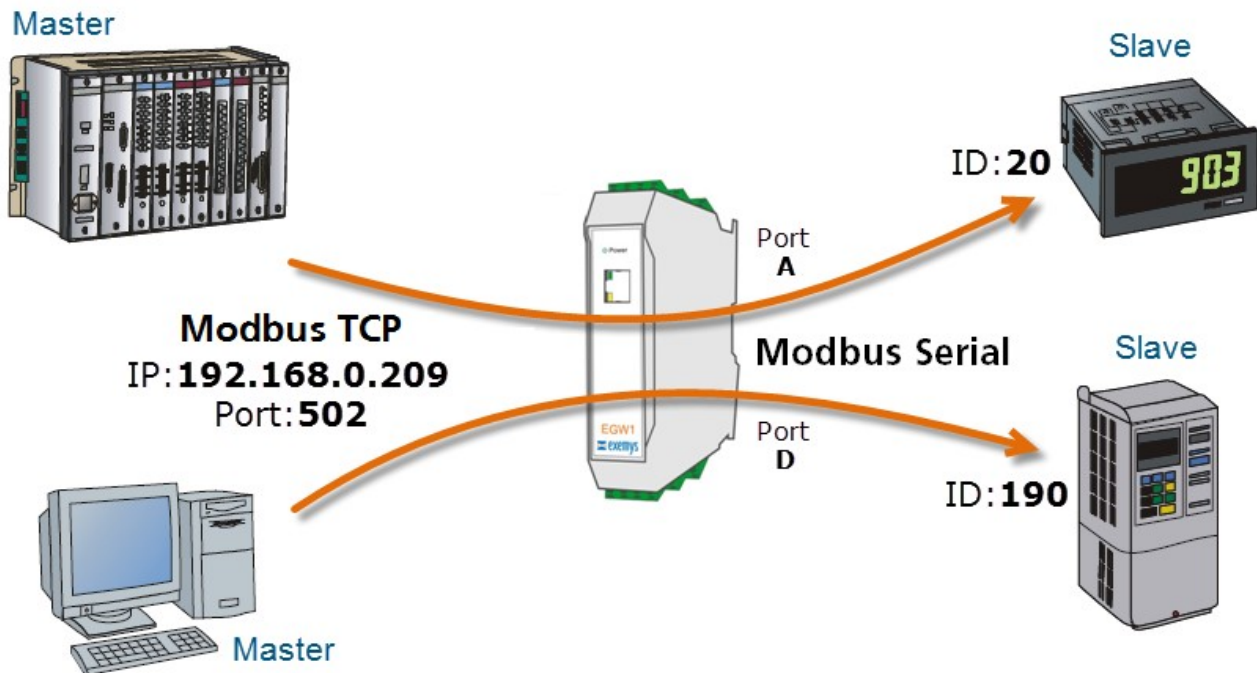
If you configured a password, the computer will ask for it when entering the web page. In this case, you must enter "admin" as the user and then the password that was set. If you want to change it, you can do it from the Administrator menu

4 OPERATION MODES

When you enter the EGW1-IA3-MB configuration web page, you can configure the device to use it in one of the following modes:

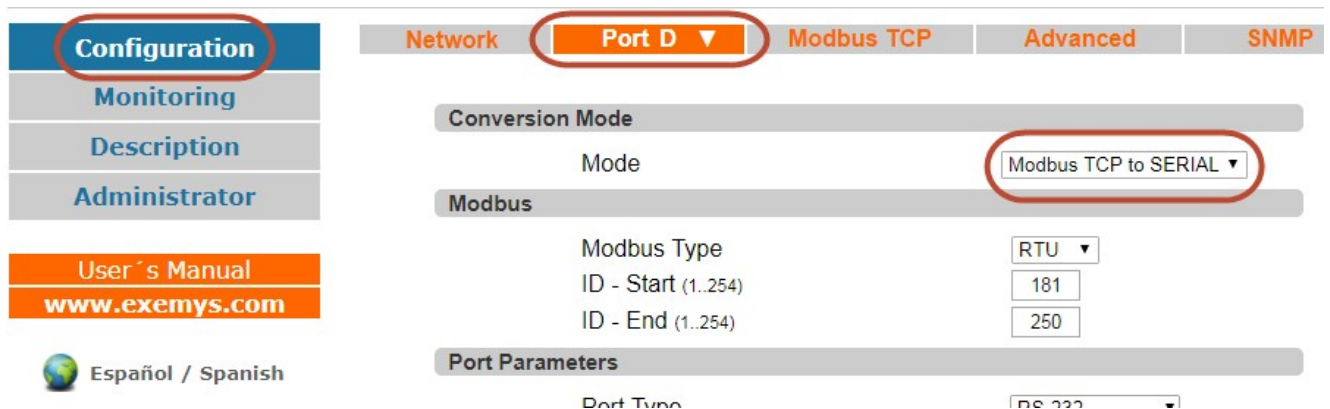
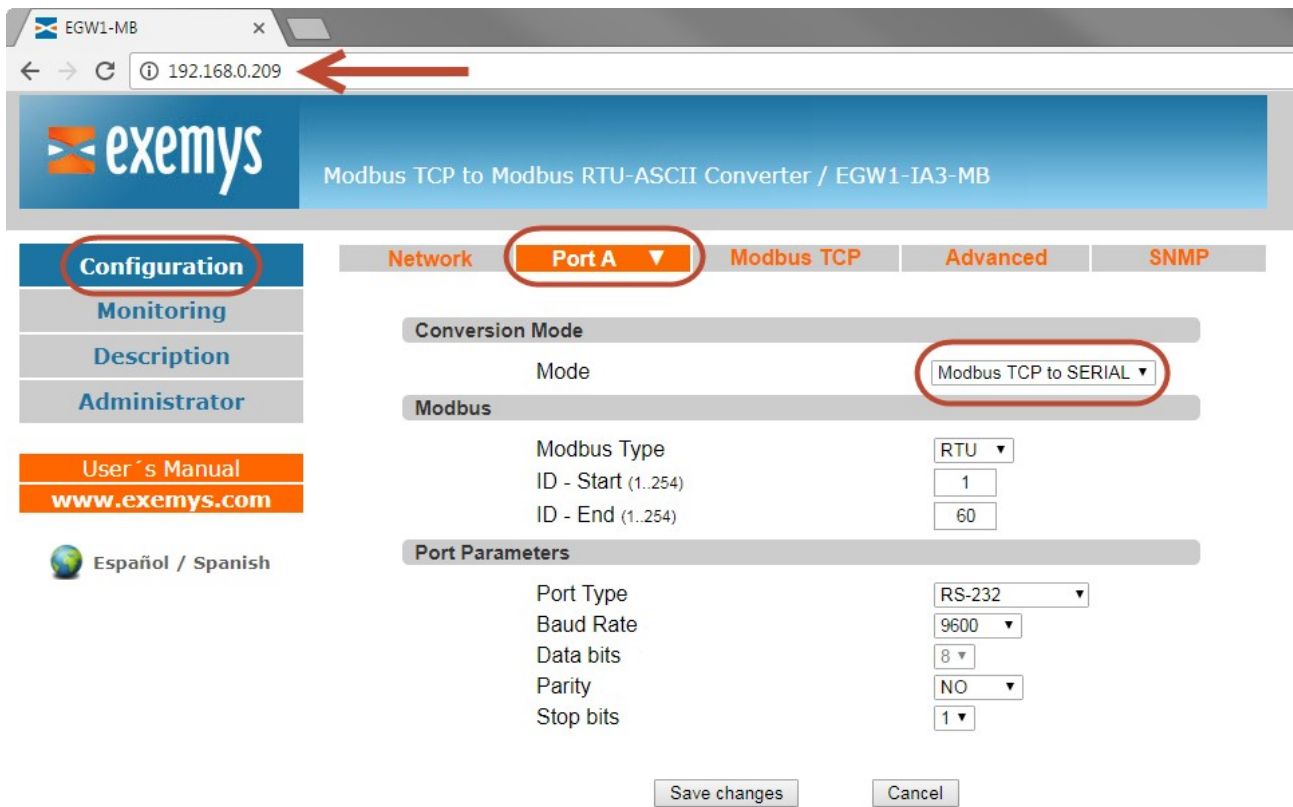
4.1 Modbus TCP to Modbus Serial

In this operation mode, the device role is translating "incoming" queries over the Ethernet interface in Modbus TCP mode and sends them as "outgoing" queries to the Serial interface in Modbus Serial mode.



To use this mode, you must set the Modbus type to use (RTU or ASCII), the Modbus ID range of the devices to be connected in that port, baud, parity, etc. in the selected Serial Port.

This configuration is done on the web page in Configuration / Port Tab. The figures below show a typical configuration case, in Modbus TCP to SERIAL mode, with ID range from 1 to 60, for Port A and ID range 181 to 250 for Port D. With device IP address 192.168.0.209.



Device can receive up to 16 simultaneous incoming connections on Modbus TCP.

4.1.1 ENRON

From the firmware version 2.1, the EGW1-IA3-MB is added the feature conversion Modbus TCP to Modbus ENRON.

This feature allows you to connect a Modbus Master, for example a SCADA, to a Modbus ENRON slave, without needing to use the ENRON driver.

To use this mode, it must set the selected serial port in Modbus TCP to Modbus Serial Mode and enable Slave Modbus ENRON option.

Configuration

Monitoring

Description

Administrator

User's Manual

www.exemys.com

Español / Spanish

Network **Port A** Modbus TCP Advanced SNMP

Conversion Mode

Mode Modbus TCP to SERIAL

Modbus

Modbus Type RTU

ID - Start (1..254) 1

ID - End (1..254) 60

Slave Enron Disabled

Port Parameters

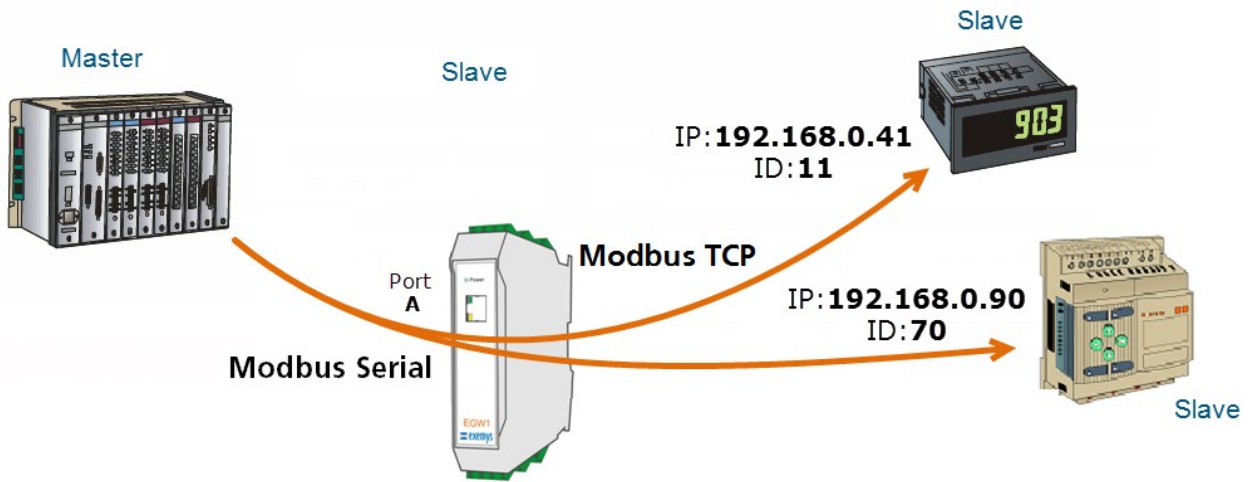
Port Type RS-232/RS-485



For more details and examples about Slave ENRON Modbus, see **Appendix E**.

4.2 Modbus Serial to Modbus TCP

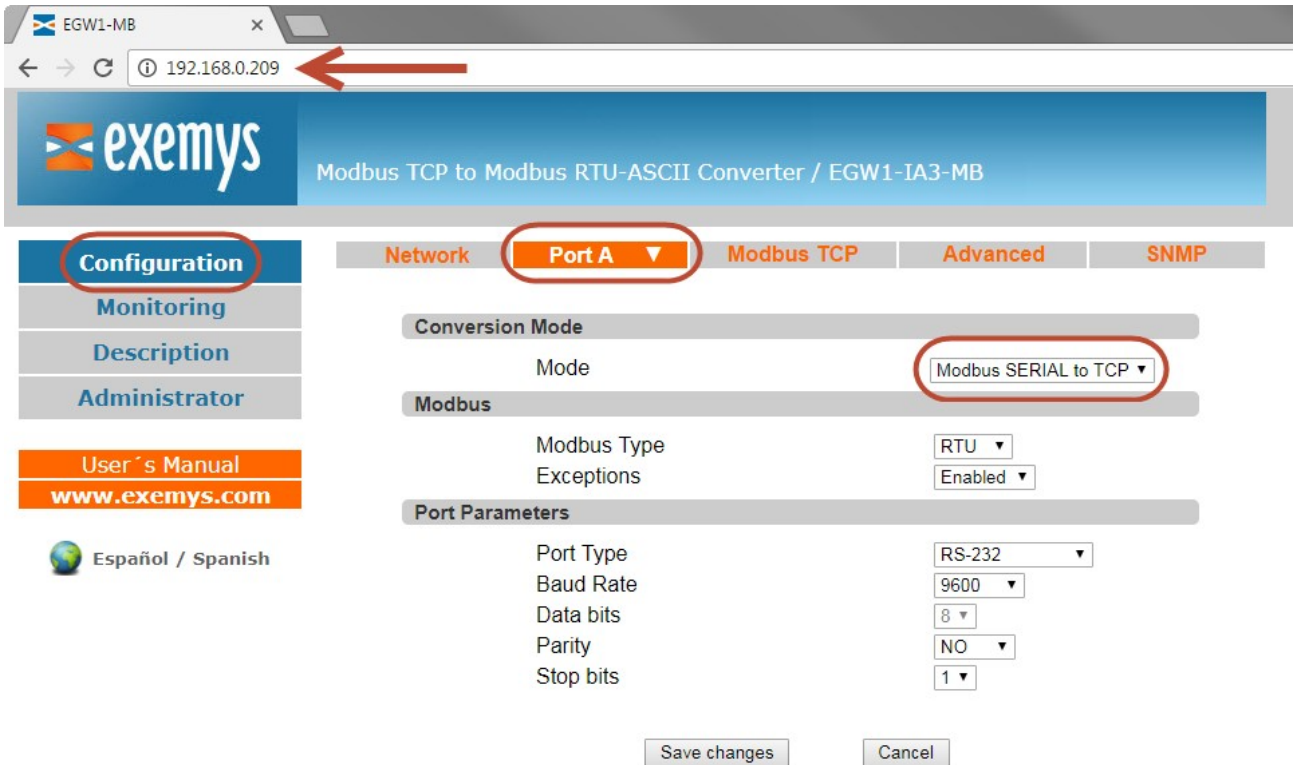
In this operation mode, the device role is translating "incoming" queries through Serial interface in Modbus Serial mode and sends them as "outgoing" queries to the Ethernet interface in Modbus TCP mode.



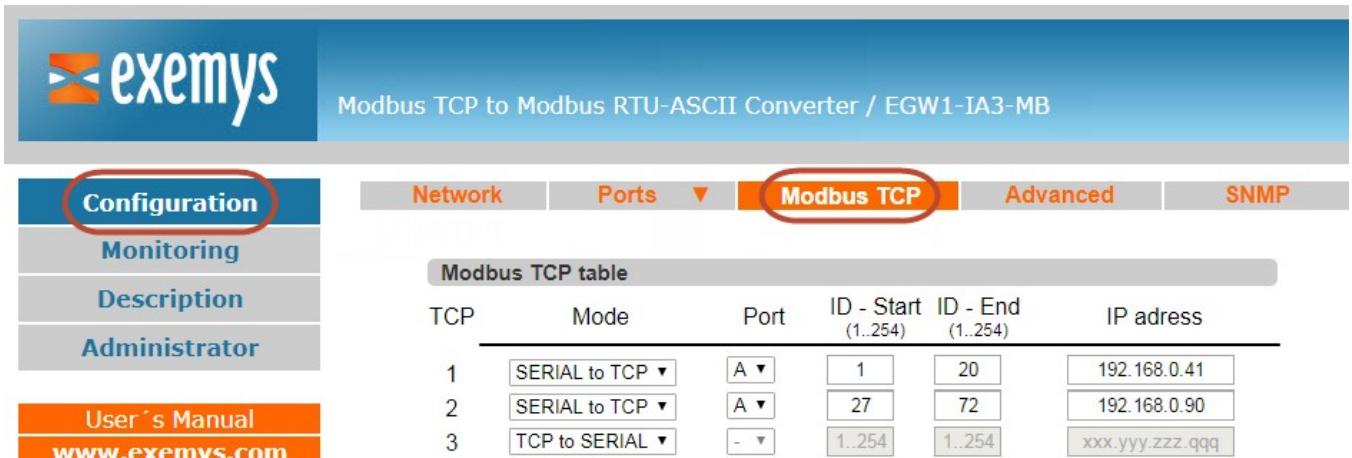
To use this mode, you must set the Modbus type to use (RTU or ASCII), baud, parity, etc. in the selected Serial Port. Besides, the range of IDs to be accessed and the IP address of the device to send the incoming queries must be to set in the MODBUS TCP table.

This table has the capacity to handle up to 16 TCP connections.

The figures below show a typical configuration case, in Modbus Serial to Modbus TCP mode.



In the Modbus TCP Table, the ranges of IDs and the destination IP are added for each port configured in Modbus SERIAL to TCP mode. In this example IDs 1 to 20 and 27 to 72 are configured, each with its destination IP.



On devices with more than one serial port, each of them can be configured in Modbus SERIAL to TCP mode independently.

4.2.1 Exceptions

You can enable or disable the "Exceptions" parameter, which enables the EGW1-IA3-MB to respond or not to exceptions in case of communication errors. If the option is disabled the EGW1-IA3-MB will remain silent before the errors, otherwise it will return an exception code:

- **0x0A- Road not available**
 - The message has ID of a device that is not configured in the MODBUS TCP table.

- Failure to open the TCP connection. The reasons for this error may be transient or incorrect configuration.
- **0x0B- The remote device is not responding**
 - No response within the maximum message waiting time (Message Response Time).
 - Invalid message header received.
 - The connection was closed while waiting for the answer.

4.3 TCP to Transparent Serial Converter

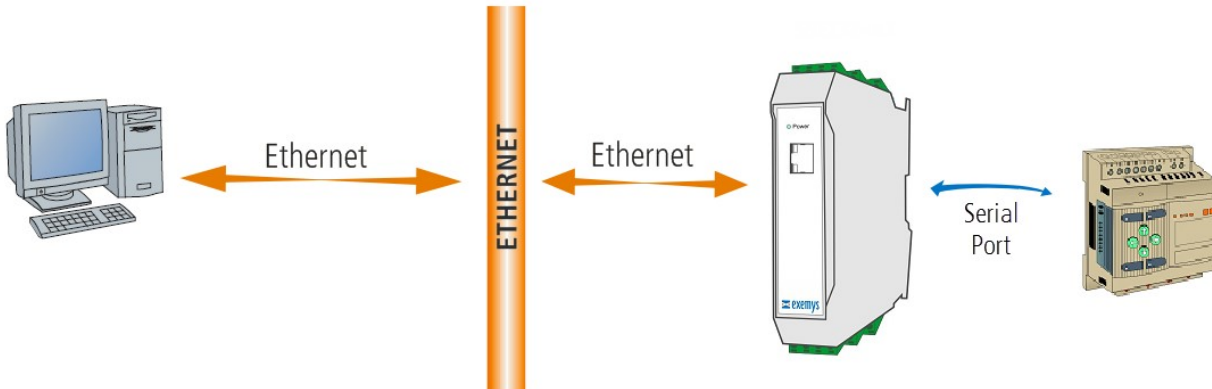
In this operation mode, EGW1-IA3-MB behaves like a serial server in TCP Server Mode.

In this mode the EGW1-IA3-MB will be listening and waiting for a client to establish a TCP connection. Once this connection is established, all data received on the Ethernet interface will be transmitted to the serial port and vice versa transparently, functioning as a TCP to RS-232 / RS-485 / RS-422 converter and vice versa.

The port of this TCP connection will be informed on the web when selecting the using mode.



While the EGW1-IA3-MB is in Transparent mode it stops functioning as a Modbus TCP to Modbus SERIAL converter



4.4 Parameter common to all Modes

The following parameters can be configured in the device serial port:

Parameter	Options
COM Type	RS-232/RS-485 or RS-232 - RS-485/RS-422
Baud Rate	300 to 115200 bps
Data Bits	ASCII (7 - 8) / RTU (8)
Parity	No / Even / Odd
Stop Bits	1 / 2

4.4.1 Modbus write commands protection



This feature is available since firmware 2.6

This feature will block the write commands issued by the Modbus master devices before sending them to the slaves.

This will not apply to the built-in digital I/Os.

The commands that are blocked are the following:

- **0x05** : Force Single Coil.
- **0x06** : Preset Single Register.
- **0x0F** : Force Multiple Coils.
- **0x10** : Preset Multiple Regs.
- **0x15** : Write General Reference.
- **0x16** : Mask Write 4X Register.
- **0x17** : Read/Write 4X Registers.

To enable this feature go to the serial port web page (Configuration / Port X).

The write commands protection will work on these modes:

- Modbus TCP to Modbus Serial
- Modbus Serial to Modbus TCP

Configuration
Monitoring
Description
Administrator

User's Manual
www.exemys.com

 Español / Spanish

Network **Port A** Modbus TCP Advanced SNMP

Conversion Mode

Mode Modbus TCP to SERIAL

Modbus

Modbus Type RTU
ID - Start (1..254) 1
ID - End (1..254) 60
Slave Enron Disabled
Modbus Write Protected Disabled

Port Parameters

4.4.2 RTS terminal control (for serial radio modems)



This feature is available since firmware 2.7

This feature allows the EGW1-MB-1C0-10C-IA3-IS and EGW1-MB-1C0-00-IA3-IS, to control the RTS terminal to control serial radio modems.

To enable it, go to Port A web page and configure the RTS terminal logic, the time to wait to send the data after turning the terminal ON, and the time to hold the terminal ON after sending the data.

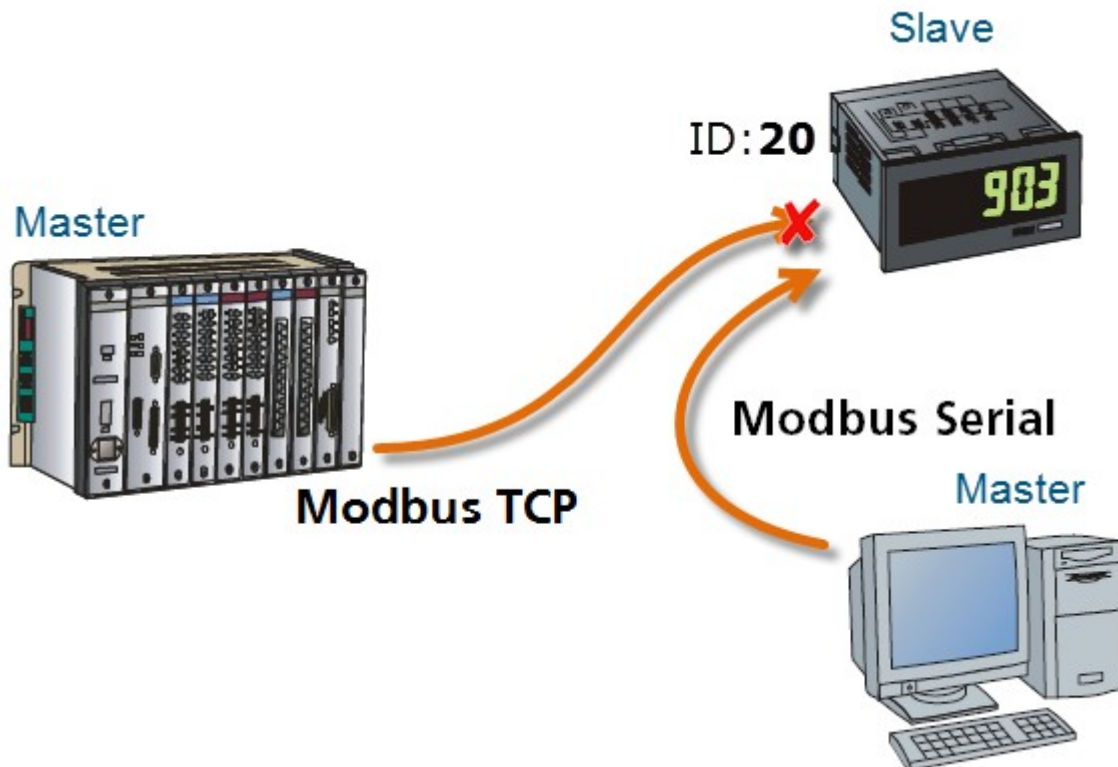
The screenshot shows the web interface for configuring Port A. On the left, there is a navigation menu with 'Configuration' highlighted. The main content area has tabs for 'Network', 'Port A', 'Modbus TCP', 'Advanced', and 'SNMP', with 'Port A' selected. Under 'Port A', there are settings for 'Data Rate' (9600), 'Data bits' (8), 'Parity' (NO), and 'Stop bits' (1). Below these is a section titled 'Radio (RTS)' which is highlighted with a red box. It contains three input fields: 'Logic (0..1)' with the value '1', 'ON Time (0..1000 ms)' with the value '200', and 'OFF Time (0..1000 ms)' with the value '500'. At the bottom of the configuration area are 'Save changes' and 'Cancel' buttons.

The default values are 0 ms.

5 ADVANCED USAGE MODES

5.1 Modbus Multiplexer, TCP to Serial and Modbus Serial to Serial

In this advanced usage mode, the EGW1-4B0-00-IA3-MB, solves the problem of having a serial slave being interrogated by a Serial Master (Modbus Serial-Serial) and a remote master, through Modbus TCP (Modbus TCP-Serial).



Once the problem has been presented, to use this mode, the EGW1-4B0-00-IA3-MB must be configured as follows:

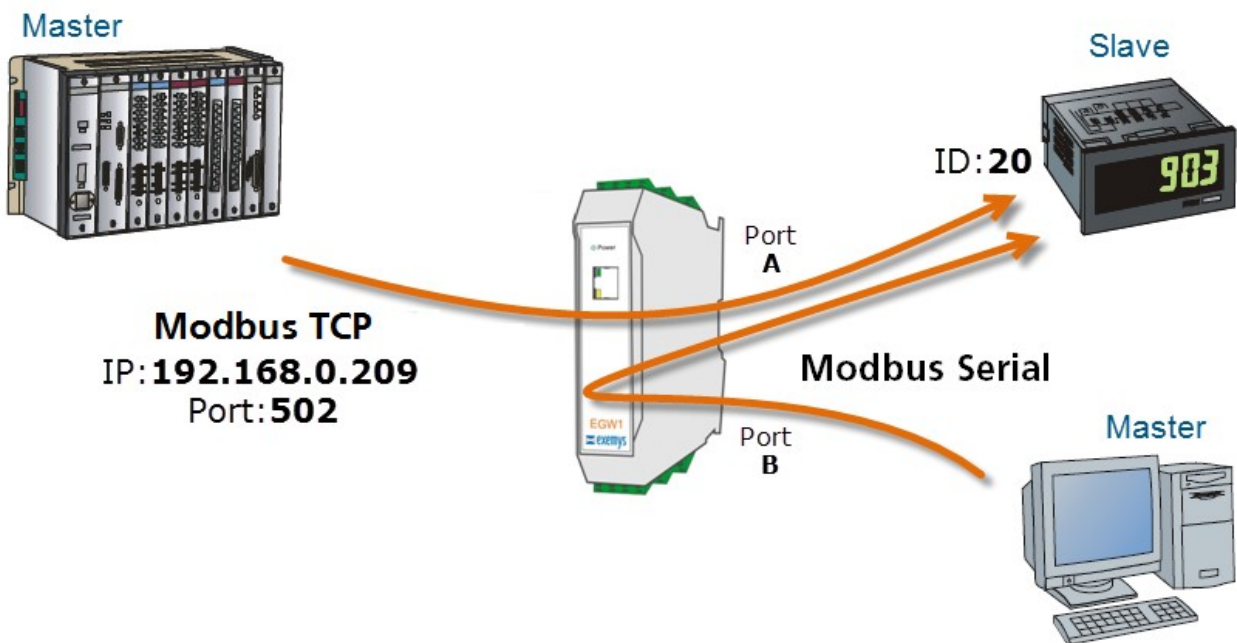
- A port, for example we will use Port A, configured in Modbus TCP to Modbus Serial mode and the range of devices IDs with which we will communicate serially. In this way we establish the Modbus TCP-SERIAL communication.
- A port, for example we will use Port B, configured in Modbus Serial to Modbus TCP mode, but at this time we will not set anything in the Modbus TCP table, as its use in 3.3.2.

In this way we establish the Modbus SERIAL-SERIAL communication, because if device does not find a TCP connection loaded in the Modbus TCP table, it will look for if any Serial Port is configured in Modbus TCP to SERIAL and when detecting at least one in This mode (in our case Port A), verifies that the destination ID is included in the range that the Serial Port has configured, so, sends the query by the found Serial Port and not by the TCP connection. In this way the Modbus Serial-Serial Mode is gotten.

NOTE: In this example, there are no values in the Modbus TCP table for the Port B, that's why it works Modbus Serial to MODBUS Serial mode.

The screenshot shows the web interface for the EGW1-IA3-MB device. The browser address bar shows the IP address 192.168.0.209. The page title is "Modbus TCP to Modbus RTU-ASCII Converter / EGW1-IA3-MB". The navigation menu includes "Configuration", "Monitoring", "Description", and "Administrator". The "Configuration" tab is active, and the "Port A" sub-tab is selected. The "Conversion Mode" section shows "Mode" set to "Modbus TCP to SERIAL". The "Modbus" section shows "Modbus Type" set to "RTU", "ID - Start (1..254)" set to "1", and "ID - End (1..254)" set to "60". The "Port Parameters" section is partially visible.

The screenshot shows the web interface for the EGW1-IA3-MB device, specifically the "Port B" configuration page. The browser address bar shows the IP address 192.168.0.209. The page title is "Modbus TCP to Modbus RTU-ASCII Converter / EGW1-IA3-MB". The navigation menu includes "Configuration", "Monitoring", "Description", and "Administrator". The "Configuration" tab is active, and the "Port B" sub-tab is selected. The "Conversion Mode" section shows "Mode" set to "Modbus SERIAL to TCP". The "Modbus" section shows "Modbus Type" set to "RTU", "Exceptions" set to "Enabled", and "Port Parameters" showing "Port Type" set to "RS 232".



5.2 Combination: Modbus Serial-TCP and Modbus TCP-Serial

In this advanced usage mode, it is shown how the EGW1-4B0-00-IA3-MB can solve through its multiple ports the combinations of Modbus Serial-TCP and Modbus TCP-Serial. This means that each device port can be used in the way that the user needs.

To exemplify the above, we will demonstrate a typical use example with the following configuration:

- A port, for example, we will use Port A, configured in Modbus SERIAL to TCP mode, in the Modbus TCP Table is added, randomly, the range of IDs from 1 to 99, with its respective destination IP for Port A.
- A port, for example we will use Port C, configured in Modbus TCP to SERIAL mode, with a range of IDs from 121 to 180.

NOTE: Device supports 16 TCP connections in total, so when loading only one connection in the TCP table, Port C will support 15 TCP connections to access the serial port.

Modbus TCP to Modbus RTU-ASCII Converter / EGW1-IA3-MB

Configuration | **Port A** | Modbus TCP | Advanced | SNMP

Conversion Mode
Mode: Modbus SERIAL to TCP

Modbus
Modbus Type: RTU
Exceptions: Enabled

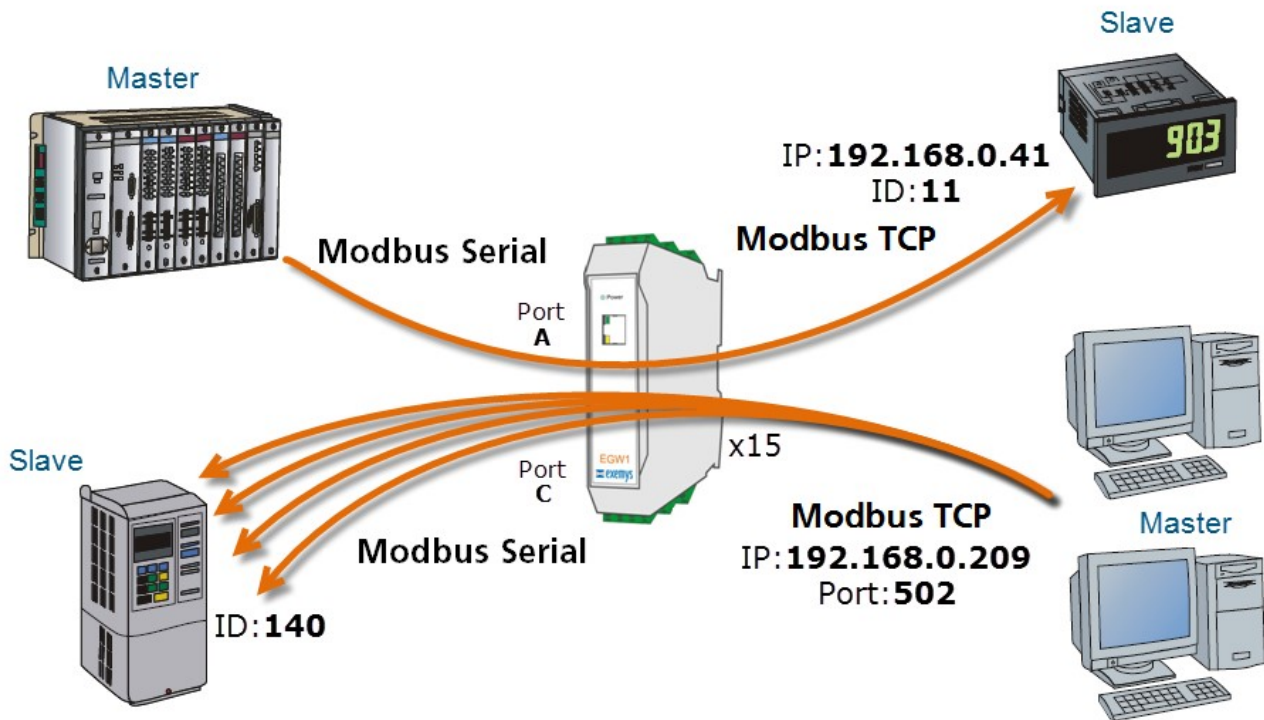
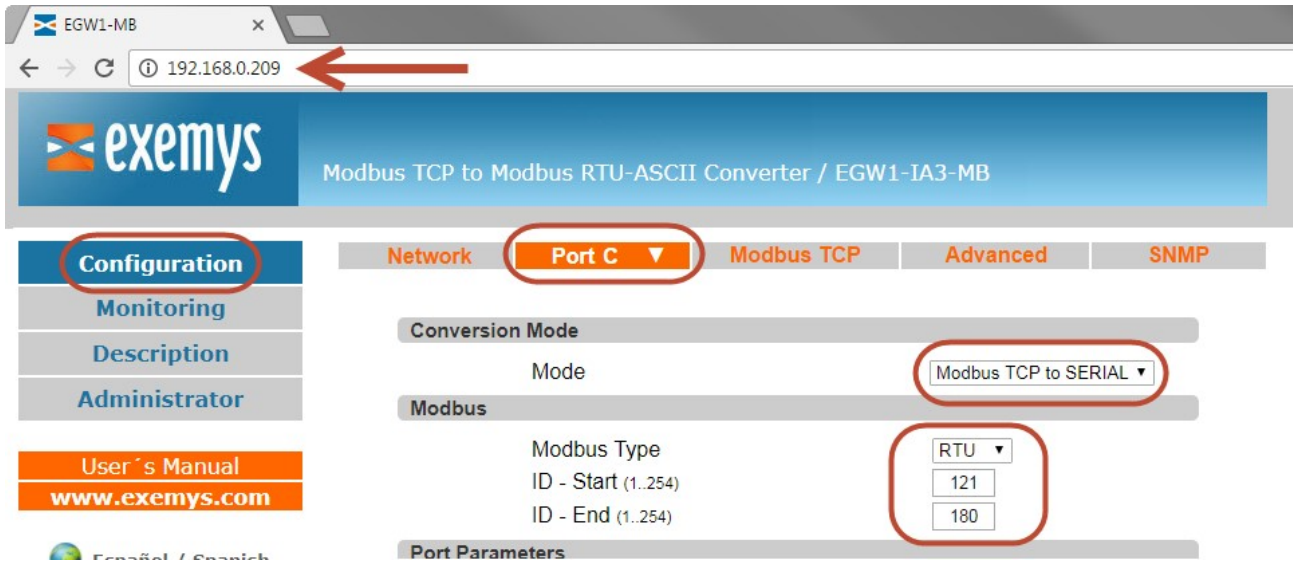
Port Parameters
Port Type: RS 485

Modbus TCP to Modbus RTU-ASCII Converter / EGW1-IA3-MB

Network | Ports | **Modbus TCP** | Advanced | SNMP

Modbus TCP table

TCP	Mode	Port	ID - Start (1..254)	ID - End (1..254)	IP adress
1	SERIAL to TCP	A	1	99	192.168.0.41
2	TCP to SERIAL	-	1..254	1..254	xxx.yyy.zzz.qqq
3	TCP to SERIAL	-	1..254	1..254	xxx.yyy.zzz.qqq
4	TCP to SERIAL	-	1..254	1..254	xxx.yyy.zzz.qqq



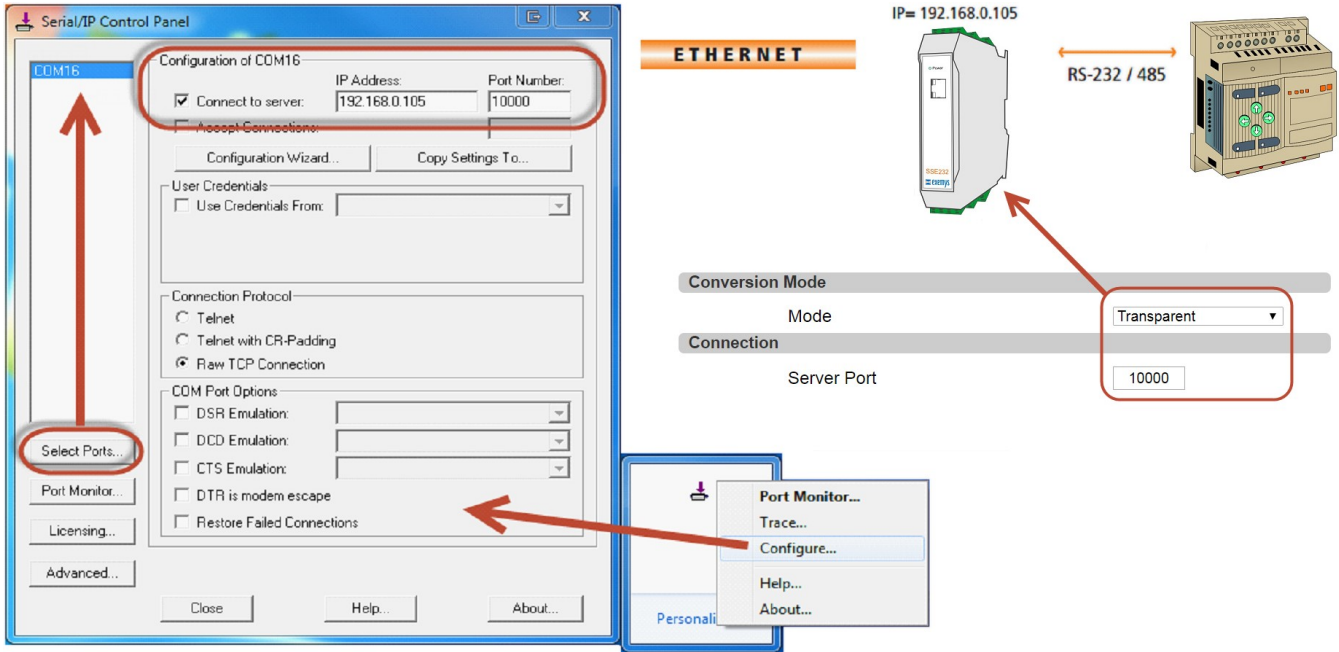
5.3 Transparent Mode - Connection with Serial Port Redirector

When using the EGW1-IA3-MB to replace a RS-232 connection between a PC and a device, you may need to install a Serial Port Redirector on your computer. This software will create a virtual COM port on your computer to use an existing software as if you were connected to the device using a physical COM port.

The redirector software currently recommended by Exemys for this application is the Serial / IP of Tactical Software. To download a 30-day trial or purchase a license contact sales@exemys.com

For this mode you must set the EGW1-IA3-MB in Transparent mode. In the redirector software you must indicate the EGW1-IA3-MB IP address and the port that appears enabling this mode.

To test if the connection is right you can press the "Configuration Wizard" button

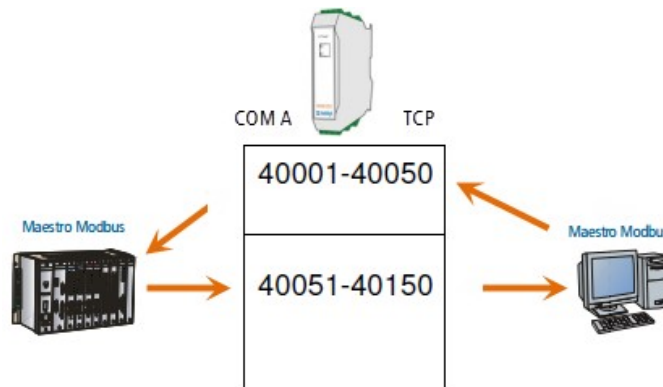


5.4 Internal Memory – Interchange between Masters

This feature allows Modbus masters connected to the device to exchange information with each other, reading and writing a device memory area made for that purpose. This mode can be used together with the other EGW1-IA3-MB functions. Exchange registers are from 40001 to 41000 (Holding Registers).

Input / Output ID number and Factory Default Memory is 240. It can be modified through the Advanced section.

Example: A master connected to Port A, henceforth Master A, needs to read 50 registers (Holding Register) from a master connected by Modbus TCP, henceforth TCP Master. In turn the TCP master needs to read 100 registers (Holding Register) from Master A. To do this, we must configure the Master A to read registers 40001 to 40050 of ID #240 to write the registers 40051 to 40150 with the information that the TCP Master needs. In the same way, configure the TCP Master to read registers 40051 to 40150 of ID #240 to write registers 40001 to 40050 with the information that the Master A needs.



6 MONITORING AND STATISTICS

EGW1-IA3-MB has a traffic control of the data that itself sends and receives. This data is shown on its web page in the Monitoring menu. Here you can see the status of the connections and different data counters sent and received.

The screenshot shows the 'Statistics' page of the Exemys web interface. It features a navigation sidebar on the left and a main content area. The main area is divided into sections: 'General' with a 'Clean All' button, and 'Selection' with two dropdown menus for 'Input' (selected as 'TCP - 1') and 'Output' (selected as 'PUERTO - A'). Below these are two columns of statistics. The 'Input' column shows a 'State: Connected (192.168.0.41)' and a table of 'Received Queries' with 61 total entries. The 'Output' column shows a 'State: ---' and a table of 'Send Queries' with 46 total entries. Both tables have 'Clean' buttons below them.

Count	Description
46	Converter.
0	Invalid.
5	Without destination.
10	Inputs/Outputs/Internal Memory.
61	Total.

Count	Description
0	Answered.
46	No Answered.
46	Total.

As seen in the previous image the statistics are divided into Input (Data and incoming connections) and Output (Data and outgoing connection); In both directions the interface to be monitored must be selected.

- The data which provides the Input statistics are:

Status: If the input interface to be monitored is TCP, device will show the TCP communication state established with it. The possible states are as follows:

Waiting ...: Waiting for the client connection.

Connected: A client established the connection with the device. Client IP address that made the connection is reported.

Serial or TCP: Number of queries received through the input interface to be monitored and sent to the opposite interface.

Invalid: Number of queries received through the input interface to be monitored and invalid, for example: poorly prepared query, out of protocol, etc.

No Target: Number of queries received through the input interface to be monitored and has no valid destination (ID).

Inputs / Outputs / Internal Memory: Number of queries received through the input interface to be monitored and are to read or write Inputs / Outputs and / or Internal Memory.

Total: The total amount of the number of queries received through the selected input interface.

- The data provided by the Output statistics are:

Status: If the output interface to be monitored is TCP, it indicates the state of the TCP communication established by the device. The possible states are as follows:

Connecting: Trying to establish the connection.

Connected: Connection established with the server.

Closed: The connection to the server was closed. This can happen when the server closes the connection, when the client closes it for inactivity, or the connection is down because the data does not reach the destination.

It can also happen when a connection is rejected by the server (because the server is not waiting for a connection at the port indicated).

Closing: The connection is closing. The client would only close a connection if it has configured an inactivity time.

Answered: Number of queries sent through the output interface to monitor that are answered successfully.

No answered: Number of queries sent through the output interface to be monitored that are not answered successfully.

Total: The total amount of the number of queries sent through the selected output interface.

7 ADVANCED

In the **Configuration** -> **Advanced** menu are advanced configuration tools that are detailed below:

The screenshot shows the configuration interface for the Exemys Modbus TCP to Modbus RTU-ASCII Converter. The interface is divided into several sections:

- Header:** Exemys logo and title "Modbus TCP to Modbus RTU-ASCII Converter / EGW1-IA3-MB".
- Navigation:** A sidebar on the left contains "Configuration" (selected), "Monitoring", "Description", and "Administrator". Below this are "User's Manual" and "www.exemys.com". At the bottom of the sidebar is a language selector for "Español / Spanish".
- Tabs:** A horizontal menu at the top contains "Network", "Ports", "Modbus TCP", "Advanced" (selected), and "SNMP".
- General settings:**
 - Built-in Inputs/Outputs Modbus ID (1..254): Input field "240", checkbox "Enabled" (checked).
 - Fixed slave ID (1..254): Input field "1..254", checkbox "Enabled" (unchecked).
 - Copy Statistics to Internal Memory: Dropdown menu "Enabled".
 - Modbus RTU Silent Interval (3..50): Input field "3".
 - Message response timeout (250..30000 ms): Input field "500".
 - Inactivity time - (Modbus TCP) (0..3600 sec): Input field "0".
- Modbus TCP to Modbus Serial:**
 - Exceptions: Dropdown menu "Enabled".
 - Buffer: Dropdown menu "Disabled".
- Buttons:** "Save changes" and "Cancel" buttons at the bottom.

Built-in Inputs/Outputs Modbus ID: This is the Modbus ID used by the device internal slave for input / output control and internal memory.

Fixed slave ID: The device will replace the Modbus query ID received by the ID given here. This parameter is used only in case the correct ID cannot be configured in the Modbus master or the slave.

Copy Statistics to Internal Memory: Enables the device to dump the statistics to the Internal Memory and to be able to access them through Modbus, leaving unused the first 300 registers of the memory for use it as internal memory, see **Appendix B**.

Modbus RTU Silent interval: Modbus / RTU packets are separated from each other by a time interval. This parameter allows changing the maximum time, counting after the last byte of the packet, during which the EGW1-IA3-MB will assume that packet has not yet been terminated. After this maximum time, the EGW1-IA3-MB will assume that the packet has finished getting. The time is in units of the time of a byte, being the minimum of 3 units.

Message response timeout: This is the maximum time which device waits for the response to the query sent to the output interface.

Inactivity Time - (Modbus TCP): If a TCP connection gets inactivity time without sending or receiving data, the connection will automatically close.

If set to 0, the connection will not be closed due to inactivity, meaning the option is disabled.

Exceptions: Enables the EGW1-IA3-MB to respond or not to exceptions in case of errors in Modbus TCP communication to Modbus Serial. If the option is disabled, the EGW1-IA3-MB will remain silent on errors. Otherwise, it will return an exception code that we detail below:

- **0x0A - Path not available:**
 - The message has the device address (ID) that is not configured in the start and end IDsset in the Port.

- **0x0B - The remote device is not responding**
 - Parity Error in serial port
 - CRC / LRC Error in serial port
 - Frame Error in serial port.
 - No response within the maximum message wait time (**Message response time**).

Buffer: Enables the EGW1-IA3-MB to save the received messages while waiting for the response from one already sent, after the pending message process is finished, the EGW1-IA3-MB will process the next one. If the option is disabled, the EGW1-IA3-MB will save only the last received message. When it has finished processing the pending message, you will process the last received message.

8 ADMINISTRATOR SETTINGS

On the **Administrator** menu, you will find device administration tools.

The screenshot shows the Exemys Administrator web interface. The header includes the Exemys logo and the text "Modbus TCP to Modbus RTU-ASCII Converter / EGW1-IA3-MB". A left-hand navigation menu lists "Configuration", "Monitoring", "Description", "Administrator" (highlighted), "User's Manual", and "www.exemys.com". Below the menu is a language selector for "Español / Spanish". The main content area is titled "Advanced" and contains the following sections:

- Password:** Includes input fields for "New Password" and "Repeat the New Password", and a "Save changes" button.
- Reset:** Includes a "Restart" button for "Restart the equipment."
- Restore:** Includes a "Restore" button for "Restore factory settings."
- Update:** Includes an "Update" button for "Firmware update..."

8.1 Password

The web page and settings by *Exemys Device Locator* can be protected with a password. This password can also be set from the serial command console (see **Appendix C**).

It only supports alphanumeric characters. User which asked to type the password is "admin".

To delete the access key, just save an empty password.

8.2 Reset

If necessary, the EGW1-IA3-MB can be restarted. In this way all your connections will be closed, and all your tasks will begin again as if it had just device energized.

8.3 Factory Reset

User can return the device to its original factory settings. This option can be executed from the web page or from the serial command console (see **Appendix C**).

8.4 Firmware Upgrade

Device firmware can be updated in case of new versions with improvements.

Pressing **Update** button, web page will ask to select the update file (it must start with EGW1 and end with .BIN). Then press the **Download** button. Through informational messages you can follow the update process.

Device will restart and be ready to operate again after uploading.



Modbus TCP to Modbus RTU-ASCII Converter / EGW1-IA3-MB

Configuration

Monitoring

Description

Administrator

User's Manual

www.exemys.com

 Español / Spanish

Update

Select Firmware

Seleccionar archivo

Ningún archivo seleccionado

Download

9 SNMP

9.1 Configuration and Operation

EGW1-IA3-MB supports the SNMP V1 protocol. It can also generate traps for notification of any events.

In the **Configuration->SNMP** menu, it is possible to enable or disable this service. It can also enable or disable the sending of traps and configure up to 2 IP Manager addresses (addresses to which the SNMP traps will be sent).

Here you can also configure the read and read/write communities. You should consider that both communities cannot have the same name.

9.2 MIB

This file describes the set of objects or parameters of the EGW1-IA3-MB accessible by SNMP. You can download the EGW1-MB.MIB file from www.exemys.com/documentation.

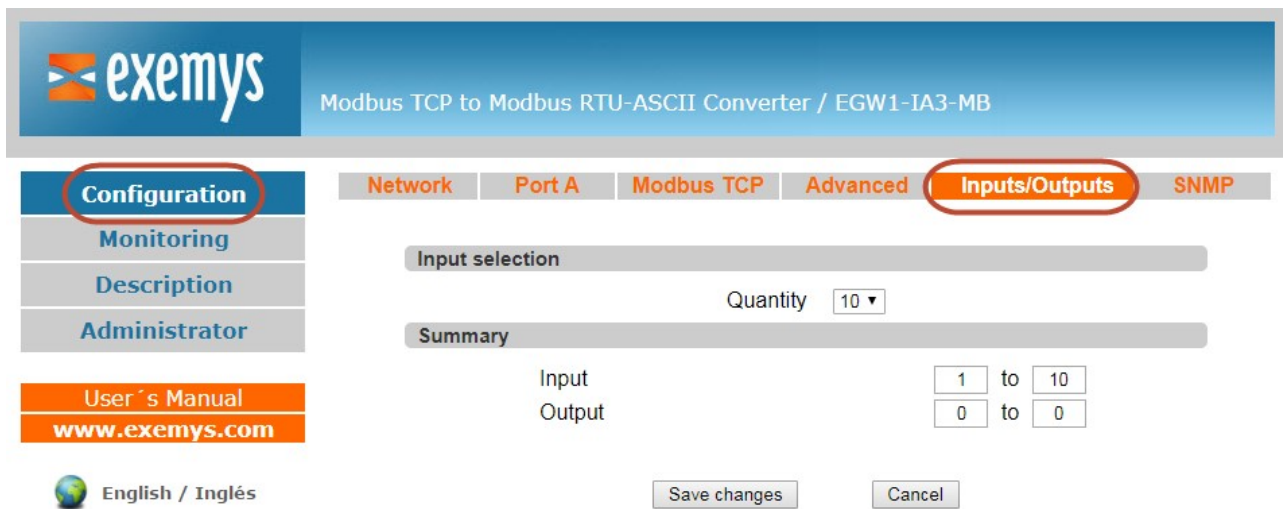
Besides to its own parameters, the EGW1-IA3-MB responds to "System Group" queries: sysDescr, sysObjectID and sysUpTime and sends the Warm Boot, Cold Boot traps and reports the status changes of the Input / Output.

10 INPUTS AND OUTPUTS

The Model "EGW1-MB-1C0-10C-IA3-IS" has Inputs / Outputs and everything related to them is explained in the following chapter.

10.1 Configuration and Control

EGW1-MB-1C0-10C-IA3-IS has 10 configurable Inputs / Outputs, such as inputs or outputs, so in the Configuration -> Inputs / Outputs menu, it must set the number of Inputs you want, meaning other ones will be configured as Outputs.



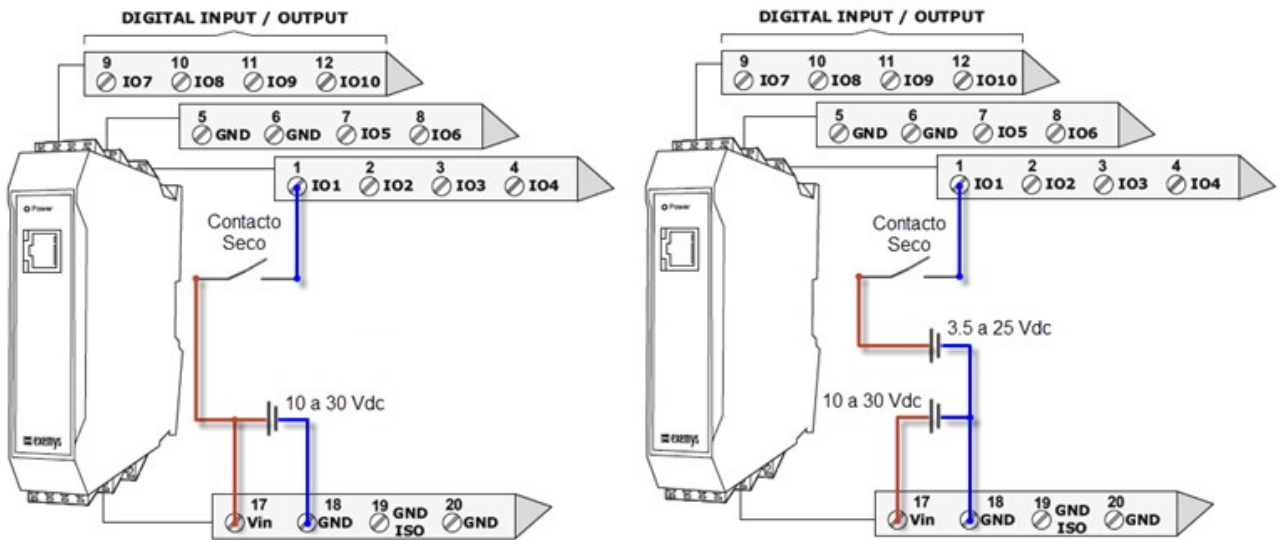
10.2 Features, consumption and connection

The following are maximum and minimum admissible values in the use of Inputs / Outputs together with examples of typical connections.

10.2.1 Digital Inputs

To activate the digital inputs a DC voltage must be applied externally. This voltage source must share the GND Terminal with the device power supply, (it can use the same device power supply). The input type is "Sinking", which accepts sensors or PNP devices "sourcing".

Parameter	Minimum	Maximum	Units
Input "ON"	7	50	[Vdc]
Input Impedance	280	-	[KΩ]

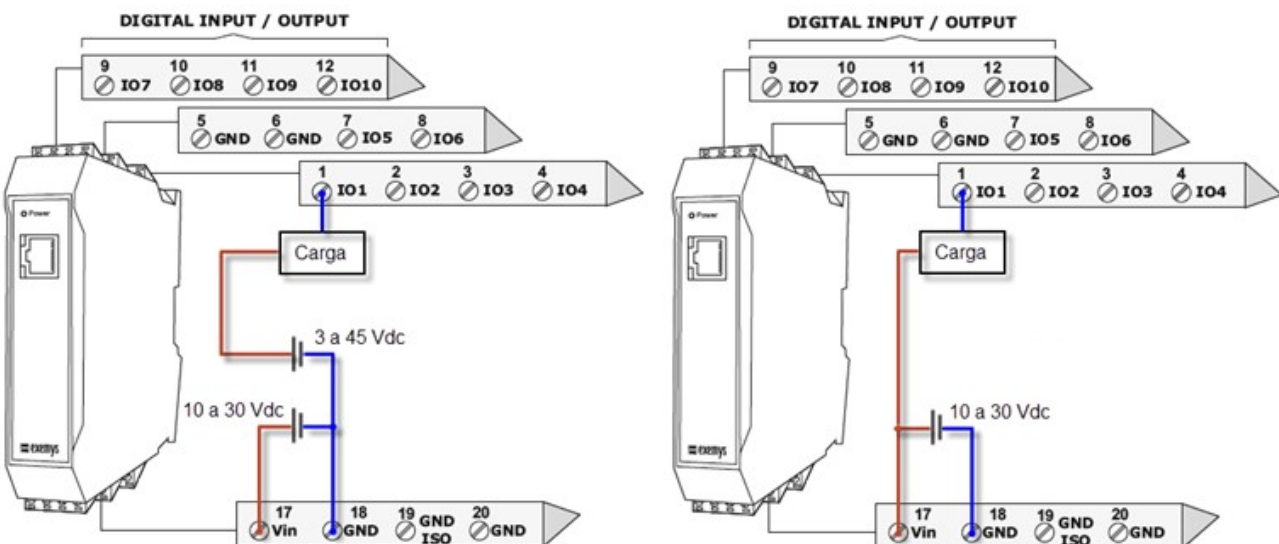


10.2.2 Digital Outputs

Digital outputs are open collector type. The load to be connected must be supplied with an external voltage source and must be shared by the GND terminal with the device power supply (it can use the same device power supply).

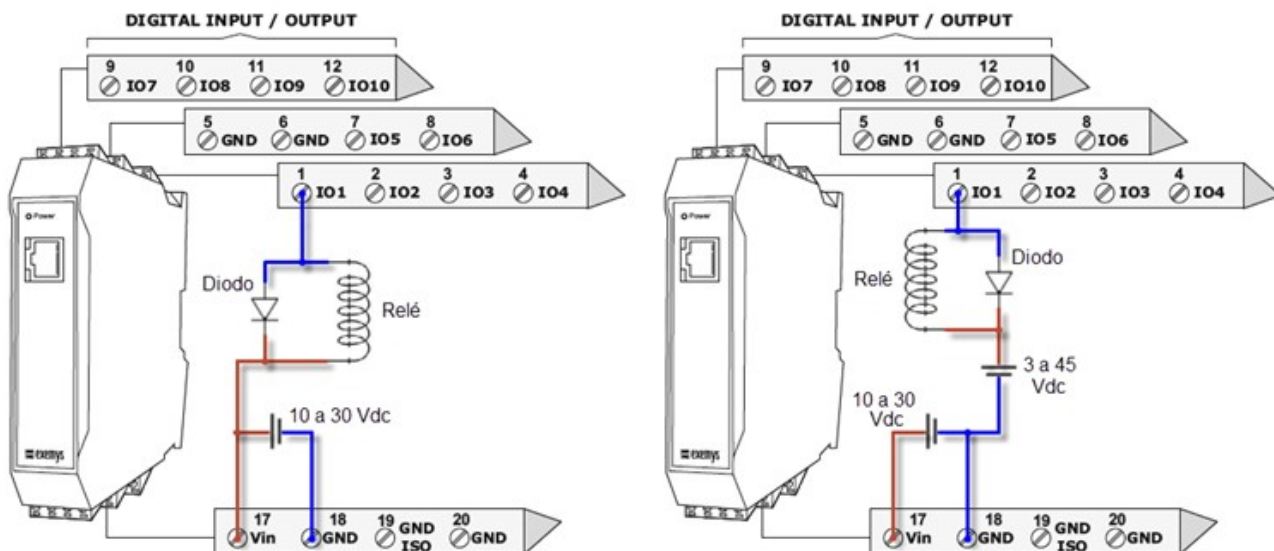
The output type is NPN Sourcing.

Parameter	Maximum	Units
Voltage Input	50	[Vdc]
Current	200	[mA]



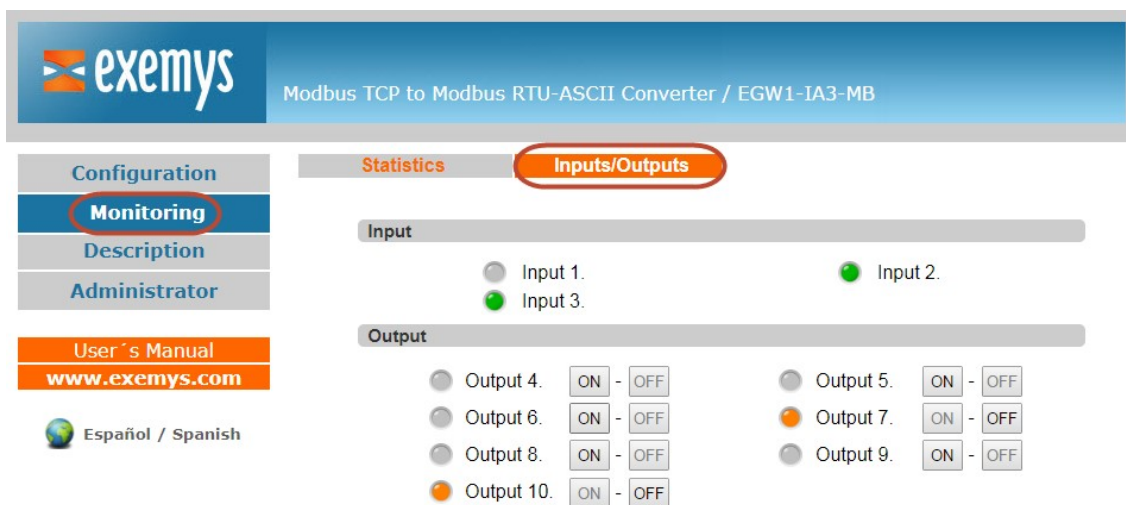
NOTA

When using the digital output to operate the relay coil it is necessary to add a protection diode to avoid damage in the device output. This must be connected in reverse, that means the anode to the device output terminal and the cathode to the positive terminal that has the Relay.



10.3 Monitoring

On the **Monitoring** -> **Inputs / Outputs** Tab, the EGW1-IA3-MB monitors the configured inputs, showing their status with a "green" color indicator, indicating that an active input is located. The Outputs also have an indicator light, in this case "Yellow", and the control over them we have it through the ON and OFF buttons, as shown in the image below.



10.4 Modbus for Inputs and Outputs

EGW1-IA3-MB Inputs and outputs can be controlled by any master connected to the device (TCP or Serial). ID to read / control is the **Inputs/Outputs Modbus ID** that is configured on the "Advanced" tab.

EGW1-IA3-MB will act on its inputs / outputs with the following Modbus commands:

1. **Read Coil Status (FC 1)**
Read the outputs status
2. **Read Input Status (FC 2)**
Read the inputs status.
3. **Write Coil (FC 5/15)**
Change one / multiple outputs status.

Appendix A

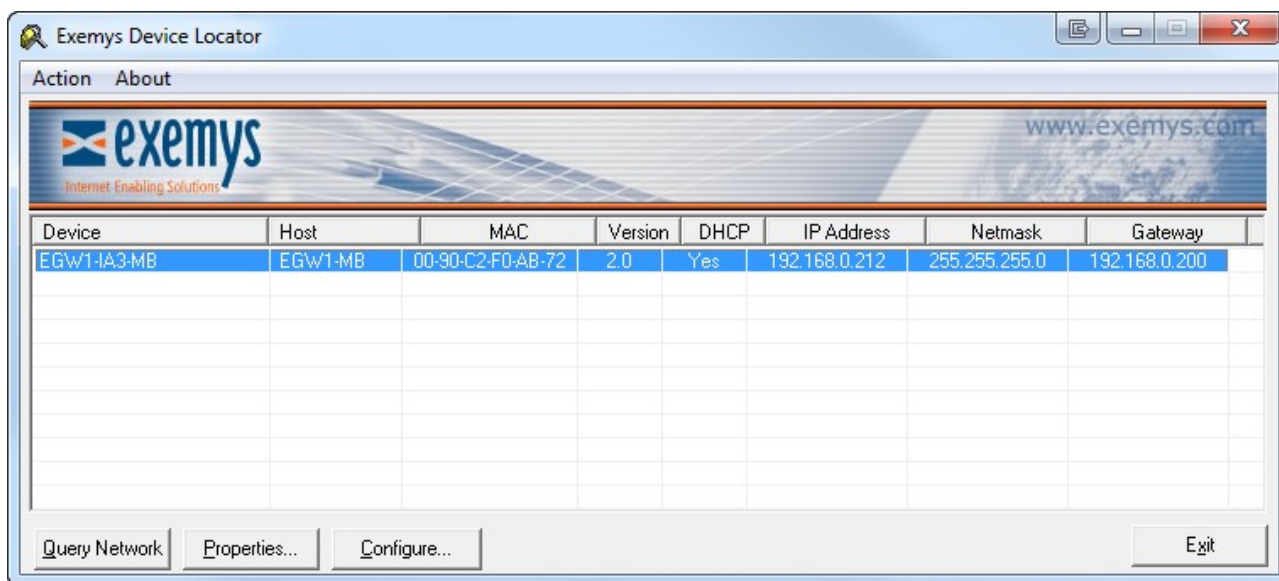
A. EXEMYS DEVICE LOCATOR

Exemys Device Locator allows setting any Exemys device basic configuration on an Ethernet network. It allows searching, identifying and setting the basic network parameters and entering directly to configuration web page.

Download the Exemys Device locator:

http://www.exemys.com/beta/software/edl_setup.exe

Exemys Device Locator must execute on a PC connected to the same network where the Exemys devices are being configured.



When *Exemys Device Locator* is executed for the first time, it will search for any Exemys device within the network.

Device: Device model name

Host: Host name assigned to the device.

MAC: Device hardware MAC address.

Version: Current Firmware version

DHCP: If "YES", then network parameters have been obtained from a DHCP server.

IP Address, Netmask and Gateway: Device network configuration.

To update the window, click on the **Query Network** button. This action will cause *Exemys Device Locator* to search the network again. You can change any of these basic network parameters within the *Exemys Device Locator*.

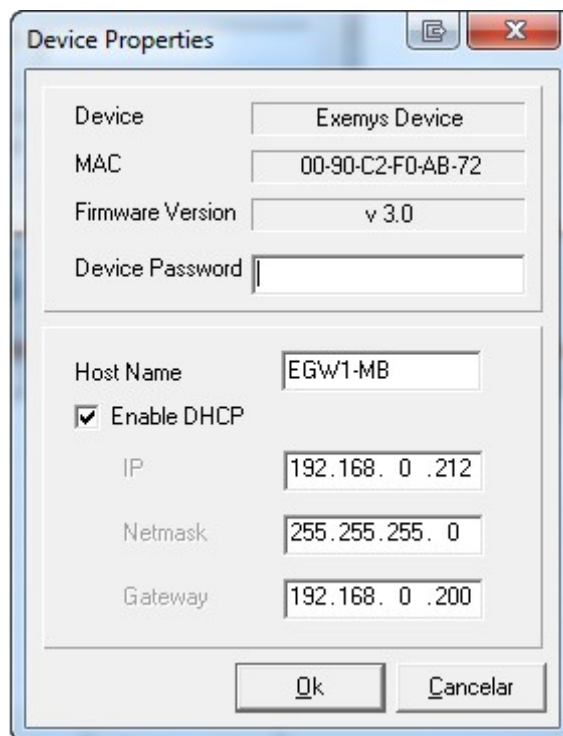
To set any Exemys device found by the *Exemys Device Locator*.

Select the device in the window and click the **Properties** button

All Exemys devices have a configuration password. If you have configured one, enter it in the **Device Password** box.

You can type an IP address, Netmask or Gateway, or you can click on "enable DHCP" check box for device to search a DHCP server.

Click on **OK** button for *Exemys Device Locator* to send this information to the device. If password is not correct, it will display "**Failed to change settings**". If password is correct, the device will be restarted for configuration changes to take effect. After a few seconds, the device will restart responding to the *Exemys Device Locator*. Click on the Search button to update the window and make sure that the parameters have changed.



Appendix B

B. MODBUS STATISTICS

Register	Description	Data Type	
Delete Statistics (Reading/Writing).			
40001	Deletes completely the statistics.		-
40002	Deletes completely the statistics.		-
Sockets status			
40003:18	Connection Status of Input Sockets (1).	Integer	-
40019:34	Connection Status of Output Sockets (2).	Integer	-
Input Sockets Queries			
40035:36	Received.	Unsigned Long	TCP1
40037:38	To convert		
40039:40	Inputs/outputs		
40041:42	Without destiny		
40043:44	Invalid		
.	.		TCPn...
.	.		
40185:86	Received		TCP16
40187:88	To convert		
40189:90	Inputs/outputs		
40191:92	Without destiny		
40193:94	Invalids.		
Output Sockets Queries.			
40195:96	Sent		TCP1
40197:98	Answered		
40199:200	No answered		
.	.		TCPn...
.	.		
40285:86	Sent		TCP16
40287:88	Answered		
40289:90	No answered		
Input Port Com Queries			
40291:92	Received.		COM1
40293:94	To convert		
40295:96	Inputs/Outputs		
40297:98	Without destiny		
40299:300	Invalids		
.	.		COMn...
.	.		
40321:22	Received		COM4

40323:24	To convert		
40325:26	Inputs/Outputs		
40327:28	Without destiny		
40329:30	Invalids		
Output Port Com Queries			
40331:32	Sent		COM1
40333:34	Answered		
40335:36	No answered		
.	.		COMn...
.	.		
40349:50	Sent		COM4
40351:52	Answered		
40353:54	No answered		

Note (1): Connection status has numerical values, which are translated into:

- 1: **Waiting ...**: Waiting for a client to connect.
- 3: **Connected**: A client established the connection with the device. Client IP address that made the connection is reported.

Note (2): Connection status has numerical values, which are translated into:

- 0: **Closed**: The connection to the server was closed. This can happen when the server closes the connection, when the client closes it for inactivity, or the connection is down because the data does not reach the destination.
It can also happen when a connection is rejected by the server (because the server is not waiting for a connection at the port indicated).
- 2: **Connecting**: Trying to establish the connection.
- 3: **Connected**: Connection established with the server.
- 4: **Closing**: The connection is closing. The client would only close a connection if it has configured an inactivity time.

Appendix C

C. COMMAND CONSOLE

EGW1-IA3-MB can be set through a command console connecting the device to a serial port on the PC.

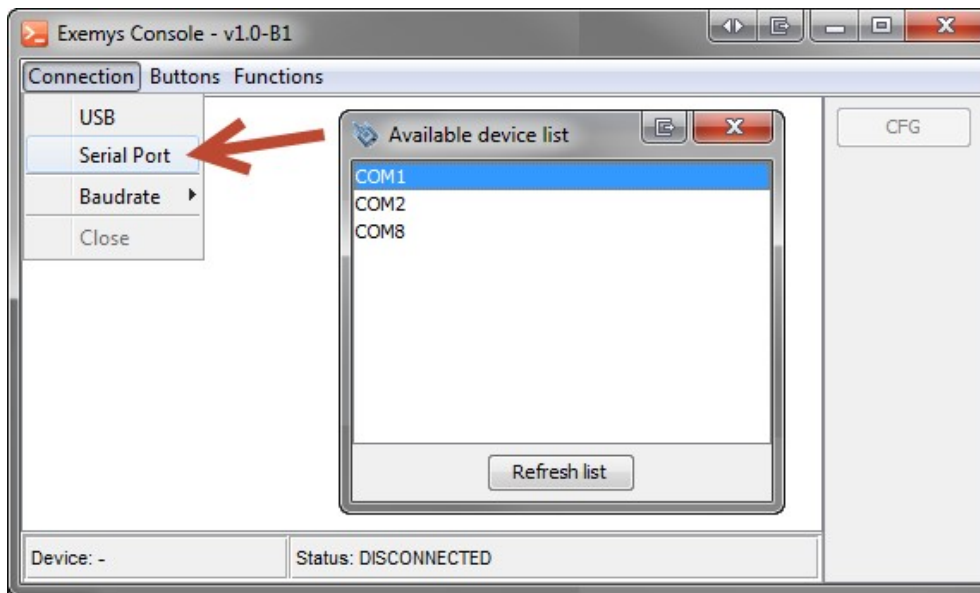
To access the command console, you must connect the EGW1-IA3-MB to a RS232 port on a PC and you must install an Exemys serial terminal program, called *Exemys Console*.

Download the Exemys Console:

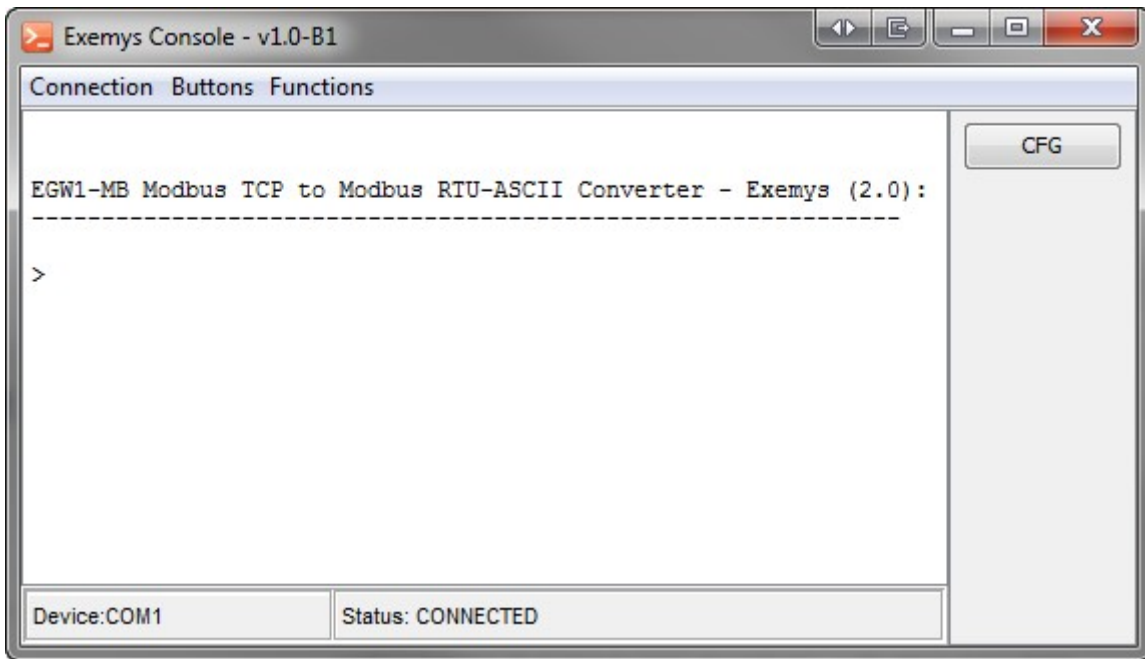
<http://www.exemys.com/console>

Once the serial terminal program is installed, connect the EGW1-IA3-MB to a RS232 port on the PC and execute the *Exemys Console*.

1. Click on Connection -> Serial Port, it will open a window with name of all COM Serial port. Select with double click the port where device is connected. Verify Baud rate in the serial por is 9600.



2. Turn on the EGW1-IA3-MB and in the first 7 seconds type CFG and press ENTER or press the CFG button. EGW1-IA3-MB will display a welcome message on the configuration command console.



3. Type the configuration command according to the following table.

Command	Description
NETWORK: ip,netmask,gateway	Change the basic parameters of the network Example: NETWORK:192.168.0.212,255.255.255.0,192.168.0.200
PASSWORD: password	Change the configuration password. Password must have a maximum of 10 characters or empty to delete it.
LIST	Request the current device configuration.
HELP	Displays the list of all available commands with syntax and descriptive text.
FACTRESET	Reset to the factory settings. This command must be entered 2 times for this to begin working.
END	It saves the changes made and it ends the command console.

4. To finish and save all the changes, type the END command, after which device will restart and return to normal operation.

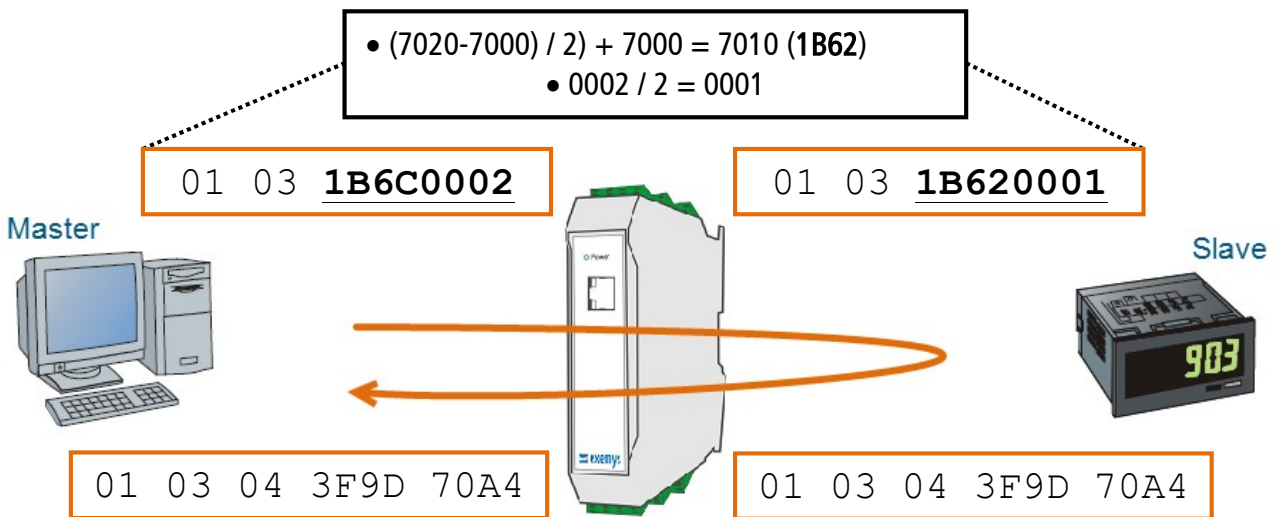
Appendix D

D.MODBUS ENRON SLAVE

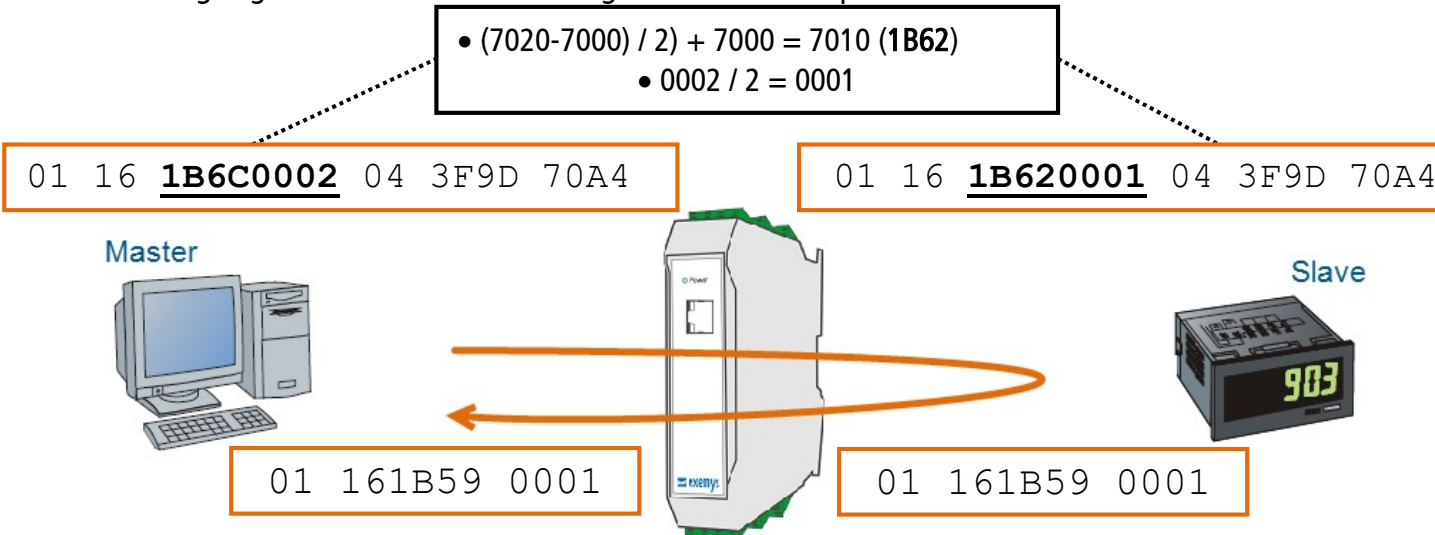
Next, we will detail the use of the Enron Slave, for which we will establish the following convections:

- 1B6C (Hexadecimal) = 7020 (Decimal)
- 1B62 (Hexadecimal) = 7010 (Decimal)
- 3F9D70A4 (Hexadecimal) = 1,23 (Floating)

Example 1: Toread the floating register 7010 from Enron Slave ID 1.Modbus TCP Master must read the Holding Register 7020:7021. The read value in the example is 1.23



Example 2: To write a floating value in the register 7010 to Enron Slave ID 1. Modbus TCP Master must write the Holding Register 7020:7021. The floating value in the example is 1.23.



Appendix E

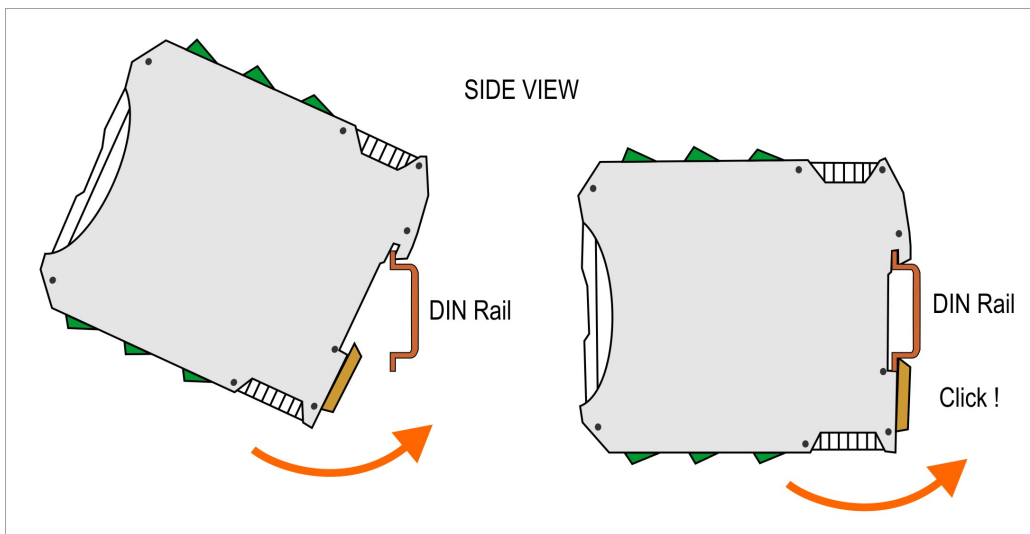
E. FACTORY SETTINGS

Parameters	Value
Network	
IP Address	0.0.0.0 (DHCP)
Netmask	0.0.0.0
Gateway	0.0.0.0
DNS 1	0.0.0.0
DNS 2	0.0.0.0
Ports - [A - B - C - D]	
Mode	TCP to SERIAL
Modbus Type	RTU
ID – Start	1 – Port: 1 4 – Port: 1 / 61 / 121 / 181
ID – End	1 – Port: 254 4 – Port: 60 / 120 / 180 / 254
Port Type	RS-232/RS-485
Baud Rate	9600
Data Bits	8
Parity	NO
Stop Bits	1
Write Protection	Disabled
RTS times	0
Modbus TCP	
1...16 -> Mode	TCP to SERIAL
Advanced	
Input/output ID and internal Memory	240
Statistics to Internal Memory	Disable
Modbus RTU packet time	3
Response message time	500
Inactivity time	0
Fixed ID for slave	Disabled
Exceptions	Enabled
Buffer	Disabled
SNMP	
Activation	Disable
Read community	Public
Read / Write community	Private
Traps community	trap

Appendix F

F. DIN RAIL MOUNTING

Device can be mounted on a DIN rail. To assembly the module to the rail, make the upper side of the device fit the DIN rail and then push gently until you hear a Click! As shown in the figure.



To disassemble the device of the rail DIN, pull down the metallic clip and then remove it as shown in the figure.

